provide for *training* in anything else. This omission can satisfy only those who believe that ability to pass an examination is sufficient evidence of training. External students are required to pass an examination in practical horticulture. The test lasts one day only, whereas not fewer than two days, and preferably three, should be spent by the student in demonstrating his skill in practical horticulture. Unless the examination is so arranged as to secure that every recipient of the degree has a sound knowledge of practical horticulture, the establishment of a degree in this subject will do more harm than good.

CONTINUATIVE EDUCATION IN FRANCE.

ENGLAND is not the only Allied country that is thinking of putting its educational house in order, even before the end of the war. Our good neighbour France is engaged on a similar project. Thanks to the kindness of M. Maurice Roger, one of the leading specialists on technical education in France, the present writer is able to give a brief account of the French proposals, which, in the light of Mr. Fisher's somewhat tantalising treatment of the subject, cannot fail greatly to interest the English public.

The Bill before the French Chamber is essentially a consolidating measure, while at the same time it introduces the principle of compulsion, the attempt at voluntary continuative education having failed to produce adequate results. Hitherto commercial and technical education have formed the subject of one law, agricultural of another, and physical training of a third. All three laws have passed one or other of the two Chambers. The new proposals will co-ordinate the three laws in one in order that the education of the future student may be similarly coordinated.

The aim of the education will be alike economic and civic, and the physical education will, in the case of the male student, lead up to military training. The unskilled, as well as the skilled, employee must attend these schools, which are not to be schools for workmen, but schools where workmen, especially the unskilled, may increase their economic productivity. It is significant to note that, in spite of the centralising traditions of French education, the classes are to be organised in accordance with local or regional needs, under the guidance of local committees for each commune. When the commune is a large town like Paris or Marseilles, the unit chosen seems very suitable, but in the case of the small village it is certainly not large enough. Such committees are to be composed of town and district councillors, doctors, official members, representatives of chambers of commerce and agricultural societies (very strong and influential bodies in certain parts of France), and delegates from associations of employers and trade-unions and various other important local societies. Above them will be a county council committee, and at the top a central committee to exercise a general oversight and control. Two stages of study are mapped out; the first is up to seventeen for boys and sixteen for girls.

Curiously enough, the recent English Departmental Committee on Juvenile Education in relation to Employment after the War also recommended two stages, but the first in the English proposals extends only to sixteen years of age. In this first period in the French scheme the obligatory subjects are French, history and geography, physical exercises, science applied to agriculture, industry, commerce, and navigation, or domestic economy, comprising practical work in each case. A minimum of fifty hours is assigned to general education, 150 to professional, and 100 to physical, the last being allotted to Sunday. This makes 300 hours, as against 320 suggested by the English committee, which proposes a minimum of only about fifty hours a week for physical exercises.

The second stage is from seventeen to twenty years of age for young men and sixteen to eighteen for girls, compared with sixteen to eighteen for English students. French, conferences on history, geography, civics, common law, and political economy are assigned a minimum of 100 hours, and the same amount is to be devoted to gymnastics and the preparation for military service. For girls the place of the latter is taken by manual work, hygiene, and some notions of medicine and child-rearing.

Existing technical, commercial, and higher elementary school buildings are to be utilised so far as possible for giving continuative education. The more technical subjects will be taught by professional teachers, but elementary-school teachers will be largely used for the more general parts of the course. To enable them to give the extra time out of school, the ordinary day-school hours will be shortened by half an hour, and the summer holidays increased to two months. If more than 200 teaching hours of continuative education are required of them they are to receive extra pay. It is very significant to note that private schools will be allowed, under certain conditions, to provide continuative education.

Cloudesley Brereton.

NOTES.

The list of honours conferred on the occasion of the celebration of the King's birthday on June 3 includes the following names of men known in scientific circles :—*Baronets:* Sir Thomas Elliott, Deputy-Master and Comptroller of the Mint (retiring); Sir Robert Hadfield, F.R.S., past-president of the Iron and Steel Institute and of the Faraday Society; Mr. James Knott, formerly president of the Institute of Marine Engineers; Sir Philip Magnus, representative in Parliament for the University of London since 1906; the Right Hon. T. W. Russell, Vice-President of the Department of Agriculture and Technical Instruction for Ireland; Dr. Frederick Taylor, president of the Royal College of Physicians. *Knights:* Prof. W. J. Ashley, professor and dean of the faculty of commerce at Birmingham University; Mr. Graham Balfour, secretary to the Staffordshire Education Committee; Mr. F. H. Barker, for his work in the development and adoption of the Parsons steam turbine throughout the principal countries of Europe; Prof. T. Kennedy Dalziel, professor of surgery, Anderson's College, Glasgow; Dr. T. Gregory Foster, the provost of University College, London; Dr. R T. Glazebrook, F.R.S., director of the National Physical Laboratory since 1899; Mr. Robert Jones, lecturer on orthopædic surgery, Liverpool University, and inspector of military orthopædics, A.M.C.; Mr. William Peck, director of the City Observatory, Calton Hill, Edinburgh; Prof. E. C. Stirling, professor of physiology in the University of Adelaide; Mr. H. F. Waterhouse, dean and lecturer on anatomy at Charing Cross Medical School. *K.C.B.:* Dr H. F. Heath, secretary of the Department of Scientific and Industrial Research. *K.C.M.G.:* Dr. R. A. Falconer, president of the University of Toronto. *C.M.G.:* Mr. R. C. Allen, Director of Surveys and Land Officer, Uganda Protectorate; Mr. T. Hood, Director of the Medical and Sanitary Service, Nigeria; Mr. F. E. Kanthack, Director of Irrigation, Union of South Africa. *C.I.E.:* Lt.-Col. D. W. Sutherland, principal, and professor of medicine, Medical College and School, Lahore, Punjab; Mr. Taw Sein Ko, superintendent, Archæological Survey, Burma. *Kaisar-i-Hind Medal:* Capt. R. H. Bott, professor of surgery, Medical College, Lahore, Punjab.

WE regret to announce the death, on June 2, of Dr. W. H. Besant, F.R.S., fellow of St. John's College, Cambridge, in his eighty-ninth year.

WE notice with regret the announcement of the death on May 29, at seventy-five years of age, of Sir William D. Niven, K.C.B., F.R.S., late director of studies, Royal Naval College, Greenwich.

ACCORDING to the *Electrician* it is proposed to change the name of the Canadian Society of Engineers to the Canadian Institution of Engineers, and to enlarge the scope of the society by the admission of electrical, chemical, mining, and mechanical engineers.

MR. STEPHEN PAGET is collecting notes for a book on the life and work of the late Sir Victor Horsley, and he asks friends, colleagues, and patients of Horsley to send him any letters which may be used for the purposes of the book. Great care will be taken to return all letters, which should be sent to Mr. Paget at 21 Ladbroke Square, W.11.

MR. J. RAMSBOTTOM, of the Department of Botany, British Museum, has been appointed protozoologist to the medical staff at Salonika. The trustees of the museum have accepted Miss Lorrain Smith's offer to act as temporary assistant in charge of the fungi during Mr. Ramsbottom's absence and to deal with inquiries relating to this group of plants. Miss Lorrain Smith has been associated with the department for many years, especially in connection with the revision and completion of Crombie's "Monograph of British Lichens," the second volume of which (by Miss Smith) appeared in 1911; the second edition of vol i., which will bring the whole work up to date, is now almost complete.

A PARAGRAPH has appeared generally in the daily Press relating to a new and wonderful explosive of American origin "so powerful that five grains, its inventor claims, would blow the largest building in the world to pieces." One must conclude that the accident which led to the discovery yielded only minute quantities, or the United States might have been disintegrated! Sensational statements of this description may appeal to the public imagination, but it must be remembered that some of the most highly explosive substances are inapplicable by reason of the difficulties and risks of manufacture, of their sensitiveness, and of our inability to control the explosion. If the new "Terrorall" is even one-thousandth as powerful as stated it by no means follows that it will prove of service in the war.

AT the aniversary meeting of the Linnean Society on May 24 the following were elected officers and council for the ensuing year:—*President:* Sir David Prain. *Treasurer:* Horace W. Monckton. *Secretaries:* Dr. B. Daydon Jackson, E. S. Goodrich, and Dr. A. B. Rendle. *Council* (in addition to these officers): Mrs. Agnes Arber; E. G. Baker; Prof. W. Bateson; E. T. Browne; R. H. Burne; Sir Frank Crisp, Bart.; A. D. Cotton: J. Groves; Miss G. Lister; Gerald Loder; Prof. G. E. Nicholls; Prof. H. G. Plimmer; Dr. D. H. Scott; Dr. A. E. Shipley; and Lt.-Col. J. H. T. Walsh. The president handed to Mr. T. G. White, secretary of the Agent-General for New South Wales, the Crisp award and medal to be forwarded to Dr. Robin John Tillyard, of Sydney University; and presented to Mr. H. B. Guppy the Linnean gold medal awarded to him for his services to biology.

IN a recent note (NATURE, May 24, p. 250) we directed attention to the renewed audibility in the south-eastern counties of the gun-firing on the Western front. We have received another account from Dr. H. S. Allen, who, from the porch on the south side of Cressington Church, Surrey, heard very distant gun-firing at 11.30 a.m. on May 28. "The church is two miles south of Surbiton, and stands on a slight eminence from which an uninterrupted view of the North Downs is obtained. There were light, variable breezes from the south-east. The reports followed one another at irregular intervals, but the average time between successive reports was about three seconds." According to Sir Douglas Haig's report, there was "considerable artillery activity on both sides during the day south of the Scarpe and in the Ypres sector."

BY direction of the War Cabinet, Dr. Addison, the Minister of Munitions, has made arrangements for the appointment of an interdepartmental committee to prepare a scheme for the establishment in London of an Imperial Mineral Resources Bureau:—(*a*) To collect information in regard to the mineral resources and metal requirements of the Empire, and (*b*) to advise what action, if any, may appear desirable to enable such resources to be developed and made available to meet requirements. The members of the committee are as follows:—Sir James Stevenson, Bt. (chairman), Mr. C. L. Budd, Sir A. Duckham, Prof. W. R. Dunstan, Mr. C. W. Fielding, Mr. J. F. N. Green, Rt. Hon. Lord Islington, Mr. L. J. Kershaw, Sir T. Mackenzie, Hon. Sir G. H. Perley, Mr. W. S. Robinson, and Rt. Hon. W. P. Schreiner. The secretary to the committee is Mr. Oswald C. Allen, and all communications on the subject should be addressed to him at the Ministry of Munitions, Whitehall Place, S.W.1.

UNDER the title, "Rhubarb and Red Tape," the *British Medical Journal* for June 2 makes the following remarks upon the suspension of the *Kew Bulletin*:—"Our contemporary, NATURE, published on May 24 an interesting and timely article on rhubarb, intended by its author for the *Kew Bulletin*, the publication of which the Government in its wisdom has decided to suspend. The official explanation given for this paltry piece of economy is that 'it has been ruled that the *Kew Bulletin* is not essential, and its publication has therefore been suspended' owing to the shortage of paper. The small amount of paper needed to secure the continued publication of so useful a periodical, which serves as a link between scientific and economic botany, could well be spared by a trifling reduction in the waste of paper in a single Government department. Lop-sided actions of this sort bring our Government into contempt, and indicate a narrowness of outlook threatening the future of the country."

SIR ERNEST SHACKLETON has returned to this country after lecturing in Australia and America on his return from the Antarctic. In a brief interview he gave to Reuter's Agency Sir Ernest said that much scientific work had been done despite the disaster to the expedition and the failure of the plan to cross Antarctica. He confirms the opinion held by all who know the Weddell Sea that it is the worst sea in the world for ice congestion and pressure. The most interesting statement he made, however, was with regard to Morrell Land, or New South Greenland, which is supposed to project northward from Antarctica into the Weddell Sea. Since Morrell, in 1823, sighted part of the coastline of this land no voyager has definitely seen it, but, on the other hand, no one has been able to sail over its supposed position, while circumstantial evidence is strongly in its favour. Sir Ernest claims to have sailed over and so proved its non-existence. It would be most interesting to have further details, with latitude and longitudes, so that this problem can be definitely cleared up. Morrell may have been a little wrong in his longitudes, but it will be surprising if no land exists in the western part of the Weddell Sea.

THE letter on "Plated Teeth of Sheep," published in NATURE of May 31, has brought us a copy of a paper "On So-called Gold-coated Teeth in Sheep," by Prof. A. Liversidge, formerly professor of chemistry, University of Sydney, read before the Royal Society of New South Wales on June 7, 1905. Prof. Liversidge received the lower half of a sheep's jawbone, the teeth of which were more or less completely encrusted with a yellow, metallic-looking substance, but more like iron pyrites (marcasite) or brass than gold. He found that the incrustation readily came off in scales when even lightly scratched with the point of a penknife. The surface of the tooth under the scale was found to be black, but apparently not decayed; the thickness of the deposit was apparently less than 1 mm. The scale partly dissolved in dilute acid. The residue consisted of filmy organic matter, still possessing a metallic sheen, although white in colour instead of yellow. When heated on platinum foil the scale blackened, partly fused, and left a white residue soluble in dilute hydrochloric or nitric acid. The residue contained phosphoric acid. and apparently consisted mainly of calcium phosphate. Under the microscope the scale was seen to be translucent and of a pale brownish colour, and under a ½-in. objective it was seen to be made of thin layers, but with no recognisable organic structure. Prof. Liversidge concluded that "the metallic lustre is due to the way in which the light is reflected from the surfaces of the superimposed films. The incrustation on the teeth is apparently a deposit of tartar, and perhaps partly due to superficial decay of the tooth."

THE Royal Academy of Sciences and Letters of Denmark has announced the subjects on which it invites memoirs, with a view to the award of its medals and prizes. The subject in history, for which the prize is the academy's gold medal, is the origin and development of alchemy among the Greeks, based on the examination of Greek literature. In astronomy the society's gold medal will be awarded to the approved memoir on the distances of stars of spectral class N (Secchi's Type IV.), their distribution in space, and the determination of their velocities. For the academy's gold medal in physics the subject is an experimental research on the transparency and electrical conductivity of thin metallic films, special importance being attached to the determination of the thickness of such films. The prize of 800 crowns arising out of the Classen legacy is offered for the approved memoir on the light thrown on the habitats and the immigration into Denmark of weeds, especially those of cultivated areas, by palæontology and history, and by the study of the various means and routes of the migration of these plants. In all these cases memoirs must be sent in by October 31, 1918. The prize of 800 crowns derived from the Thott legacy is to be awarded in connection with a subject announced in 1914, namely, a description based on existing literature, as well as on personal research work, of the facts which ought to be taken into account in drying seeds, special attention being given to the kinds of direct interest to Danish agriculture. These memoirs are to be sent in by October 31 next. The essays may be written in any one of seven specified languages, including English, and are to be sent to Prof. H. G. Zeuthen, secretary of the Academy.

A STATUE of the eminent chemist, Prof. Marcelin Berthelot, sometime professor at the Paris School of Pharmacy, was unveiled in Paris on May 21. We reprint from the *Chemist and Druggist* the following interesting account of the ceremony given by its Paris correspondent:—"The Sorbonne, as the home of the faculty of sciences and the heart of the Latin Quarter, was appropriately chosen for the function, which marked the close of the Exhibition of 'School and War,' organised by the French Teaching League. The great amphitheatre was filled to suffocation, and on the platform were the representatives of official and intellectual France—M. Raymond Poincaré and his Ministers of State, the Paris Municipal Council, and the teaching staff of the University. The speakers were the head of the College of France (to which Berthelot was attached), the Prefect of the Seine, the President of the Municipal Council, the Director of the French Academy, the Vice-President of the Italian Senate, and others. There was a war-time note in many of the speeches. M. Armand Gautier, the chosen orator of the Academy of Sciences, told how during the 1870–71 siege of Paris he met Berthelot returning from a visit to the outposts, where he had accompanied a French general. The *savant* had shown the soldier how the defence of the city could be improved; the general had hesitated for fear of reprisals, not wishing to provoke the enemy to bombard Paris. Shortly after, the Latin Quarter was shelled, and the College of France and the Museum were damaged. M. Painlevé, Minister of War, referred to the same epoch. Not only did Berthelot show how chemical substances could be synthesised, but 'he dared to apply scientific methods to these explosives, the violence and terrible rapidity of which seemed to defy all control, but of which the artilleryman must understand the laws the better to regulate and subjugate.' It was 'his long and obstinate research into the problems of waves of explosion which led up to M. Vieille's discovery of smokeless powder.' The speeches terminated, the official *cortège* proceeded to the statue hard by—the work of M. René de Saint-Marceaux. When this was unveiled the Paris school children and the Cadet Corps—some thousands of young people in all—marched past the monument of the *savant* and patriot."

THE importance of ethnobotany, a new field of research which, if investigated systematically, will yield results of great value both to the ethnologist and the botanist, is now fully recognised, particularly in America. The questions with which the ethnobotanist deals are: the primitive ideas and conceptions of plant life; the effects of a given plant environment on the lives, customs, religion, thoughts, and everyday practical affairs of the people studied; the use of plants for economic, magical, or ceremonial purposes; how far their knowledge of plant life extends; the study of plant names as a branch of the local folklore. The methods and results to be gained from this field of investigation are fully explained in Bulletin No. 55 of the American Bureau of Ethnology, entitled "Ethnobotany of the Tewa Indians," by Messrs. W. W. Robbins and J. P. Harrington and Miss Barbara Freire-Marreco, which supplies a useful introduction to this new field of research.

THE Journal of the Academy of Natural Sciences of Philadelphia, second series, vol. xvi., part iii., is devoted to a report, printed in a style which few societies in this country can rival, compiled by Mr. C. B. Moore, on some aboriginal sites on Green River, Kentucky, and on the Ohio and Mississippi. Some of these implements supplied curious objects made of deer's antlers, hooked at one end, and having a cavity in the other, in which fragments of asphalt were found, apparently intended to fix something introduced into the cavity. There is some doubt as to the object for which these articles were intended. Possibly the hooked implements were used as netting needles, while others of a different form were "sizers," used for spacing the meshes of the nets. The cavity may have held some decorative object. The full collection of photographs appended to this report will doubtless soon lead to a final settlement of the use of these implements.

Abstracts of Bacteriology is the title of a new publication issued bi-monthly under the editorial direction of the Society of American Bacteriologists, the first number appearing in February. The purpose is, as the name implies, to review current literature on bacteriology in all its various branches, and a journal of this kind will be very welcome now that German periodicals of a similar character are difficult to obtain and are tabooed by many. A list of periodicals to be reviewed is given, and comprises some 650 titles. We predict a cordial reception for this new aid to bacteriological research. The British publisher is the Cambridge University Press, Fetter Lane, London, E.C.4.

WE have received a copy of the May issue of the *Veterinary Review* (vol. i., No. 2), a new periodical devoted to veterinary science and practice. It contains a review of the present state of knowledge of specific polyarthritis, an infective disease of the joints attacking foals. The remainder of the issue is devoted to abstracts of publications, which seem to be well chosen and will be very useful, and to notes on books and a bibliography of veterinary publications (thirty-four pages). The *Veterinary Review*, which is edited by Dr. Charnock Bradley, is published quarterly by Messrs. W. Green and Son, Edinburgh, at an annual subscription of 10*s*. 6*d*.

THOUGH much has been written on the fur-seal of the Pribilof Islands, Prof. G. H. Parker, in the *Scientific Monthly* for May, has contrived, in a most admirable summary of the life-history of this animal, to add many new and important facts. Not only from the commercial, but also from the zoologist's point of view, it is fortunate that the largest existing herd of fur-seals is that which breeds on the Pribilof Islands, for these now belong to the United States, which came into possession of the islands with the purchase of Alaska from Russia in 1867. When in 1910 the lease to the North American Commercial Company expired, the Government abandoned the leasing system and took over the management of the herd to avert, if possible, the steady decline in its numbers. This decline was due, not to the regular killing on land, but to pelagic sealing resulting in the slaughter of from 60 to 80 per cent. of females, the pups of which, as a consequence, were left to starve. To save the herd pelagic sealing was forbidden, and later all killing on the islands was banned, except of such animals as were needed to furnish food for the natives until the end of the 1917 season. This, Prof. Parker considers, was a mistake, since it has encouraged the undue increase of "bachelors," which disturb the harems of the breeding bulls. These "bachelors," he contends, should be thinned by taking toll of three-year-old males, the skins being then at their prime. The average life of the fur-seal appears to be from twelve to fourteen years. But while the bulls do not begin to breed until they are six or seven years old, the females are sexually active for almost twice that period. Hence the advisability of reducing the number of "bachelors."

THE "Book of the Madras Exhibition, 1915–16," contains a report of a lecture by Mr. Jas. Hornell dealing, among other things, with the question of pearl culture in Indian seas. The author believes that a great natural pearl fishery must always be a rare and fortuitous occurrence. There will always be series of bad seasons, and now and then a successful one. The natural factors which produce these good and bad seasons are so powerful that man's interference seems to be unavailing, and further expenditure of money is regarded as useless. There are, however, very encouraging results with respect to the artificial culture of true pearls, and the production of induced pearls is already a growing industry in Japan. Small spherules of mother-of-pearl are carefully inserted between the mantle lobe and shell of the mother mollusc, and after a period of about two years a marketable pearl has been formed. This is, at best, only a three-quarter pearl, and the imperfect side must be completed by cementing on a convex flake of mother-of-pearl. Therefore the gem cannot be used as a unit for stringing, but it can be utilised wherever there is intricate mounting of some kind. Mr. Hornell refers to a process of his own whereby true pearls, absolutely flawless and spherical, can be produced. So far he has obtained pearls of microscopic size only, but this is due to the limited time of growth in the conditions of his experiments. Indian waters, he points out, are more suitable for such processes than Japanese waters, for in the former there is no winter pause of growth.

IN the *Journal of Agricultural Research* (vol. vii., No. 7) A. C. Baker and W. F. Turner give a full account of the rosy apple aphis (*A. malifoliae* or *A. sorbi*) in which some new facts of importance may be found. The authors confirm previous statements that plantain is the alternate host of the insect. Another common British aphid, *Macrosiphum granarium*, is described, with excellent figures, by W. J. Phillips in No. 11 of the same volume. This latter number contains also an account of *Syntomaspis druparum*, a chalcid which, instead of adopting a parasitic mode of larval life, lays eggs in apple-seeds, within which the grubs feed. N. E. McIndoo discusses in No. 3 of the same volume the effects of nicotine as an insecticide. He finds that the spray solutions neither pass into the air-tubes nor penetrate the cuticle and skin, but the fumes traverse the air-tubes and are distributed to the tissues, killing insects by paralysis, due to structural changes in the nerve-cells.

AT a meeting of the American Institute of Electrical Engineers in November last Prof. J. B. Whitehead, of Johns Hopkins University, gave an account of a new form of voltmeter he has developed for measuring potential differences up to 150 kilovolts. The complete paper appears in the April Journal of the Franklin Institute. The instrument depends on the constancy of the electric field at which the corona discharge is formed between a wire and a cylinder along the axis of which the wire is placed. In that reading to 100 kilovolts the wire is of nickel-plated tool steel 0·6 cm. diameter and about 150 cm. long. It is surrounded by a perforated cylindrical electrode 30 cm. diameter and 90 cm. long. Both wire and cylinder are enclosed in a cylindrical vessel in which the pressure of the air can be varied from 40 to 140 cm. of mercury. The potential at which the corona forms at the surface of the wire appears to be independent of the frequency when alternating currents are used, and to be uninfluenced by the presence of moisture in the air. It is a function of the radii of the wire and outer electrode, and of the pressure and temperature of the air. The formation of the corona is detected either by an electroscope or a galvanometer connected to the outer electrode, or by a telephone with its transmitter inside and its receiver outside the containing vessel.

THE estimation of toluene in crude petroleum was the subject of a paper read before the Institution of Petroleum Technologists on May 15 by Mr. S. E. Bowrey. It is pointed out that, whilst the process of cracking increases the percentage of aromatics in the oil, there is a serious loss of oil by carbonisation. The experiments were therefore limited to the crude oil. After carefully examining the method of fractionation and of extraction by sulphonation and nitration, all of which possess serious disadvantages, Mr. Bowrey eventually adopted the method of extraction by liquid sulphur dioxide at low temperatures as affording the most satisfactory results. The process is carried out in the following manner:—The crude oil is first distilled and the distillate collected up to 150°. The latter is then freed from unsaturated hydrocarbons by shaking with 90 per cent. sulphuric acid, and afterwards with alkali and water. The purified spirit is then extracted with successive quantities of liquid sulphur dioxide at −35°, and the combined extract carefully fractionated with a special form of fractionating apparatus. In this way a series of fractions is obtained from which the percentage of benzene, toluene, and xylene can be estimated, and the quantities are further controlled by a specific gravity determination. Each of the steps described has been carefully tested by the use of artificially prepared mixtures of light petroleum and the three aromatic hydrocarbons, and the results, considering the difficulties of the problem, appear to be very satisfactory.

A SHORT paper by Prof. K. C. Browning, of Colombo, on "The Detection of Traces of Mercury Salts for Toxological Purposes" (Journ. Chem. Soc., vol. cxi., p. 236) describes a process whereby the detection of this element can be carried to a point comparable with that reached in the case of arsenic. The method consists in depositing the mercury on a cathode of gold foil, and then vaporising it in a vacuum tube, where its presence is detected spectroscopically. Under these conditions one part of mercuric chloride in 1000 million parts of solution can be detected. Attempts to concentrate liquids containing minute traces of mercury are usually futile, on account of the volatility of the metal and its compounds; in such cases it is better to use a large volume of well-stirred liquid and rely exclusively upon electrolysis for concentration.

IN the issue of the *Engineer* for May 18 there is an interesting account of the very important hydro-electric power supply undertaking for Bombay known as the Tata power scheme, by which energy is supplied to Bombay over a distance of some forty-three miles. The source of the power is three artificial lakes, or reservoirs, in the Western Ghauts, known respectively as Lake Lonawla (986 acres), Lake Walwhan (1535 acres), and Lake Shirawta (3174 acres). They stand in order of elevation, commencing with the lowest, which exceeds 2000 ft. above sea-level, and they are capable jointly of storing sixty thousand million gallons of water. The district in which the "lakes" are situated is remarkable for its heavy rainfall. During monsoons the precipitation is extraordinary, as much as 546 in. (45½ ft.) having fallen in the catchment area during a single monsoon, of which quantity 440 in. (36⅔ ft.) fell within thirty-one consecutive days. The "lakes" have been formed by the construction of dams, which, though not of remarkable height, are certainly of unusual length. The shortest is 1900 ft. long, and the longest no fewer than 8000 ft.—just above 1½ miles. All the dams are built of masonry, with coursed faces and rubble hearting. The Shirawta and Walwhan Lakes are connected by a tunnel in hard trap-rock, 5000 ft. in length. The waterways are designed for a water capacity of 120,000 h.p., with a maximum velocity of about 5 ft. per second. Sufficient capacity is provided in the forebay to keep eight turbines, each of 11,000 b.h.p., working at full load for 1½ hours. The length of pipe line from the forebay to the power-house is 13,000 ft., and the difference in level is 1725 ft. The plant was formally put into service in April, 1915.

Engineering for May 18 contains an illustrated account of a new 15,000-kw. three-phase turbo-alternator recently erected at the Chelsea power station of the Metropolitan District Railway. It is of interest to note that only ten years ago builders were considered greatly daring in constructing turbo-generators of 5000-kw. capacity at 1000 revolutions per minute. Improvements in generator details have been responsible for this notable advance. In view of possible changes in the boiler plant at Chelsea, the new machine was specified to be capable of working with steam at 200 lb. per sq. in (gauge) and 600° F., but to run its trials at 185 lb. per sq. in. (gauge) and 500° F., giving a superheat of 125° F. only. These test conditions give a steam consumption of about 7 per cent. more than if the tests had been carried out at the higher pressure and temperature. The results under these test conditions, with a vacuum of 0·75 in. absolute back pressure, are as follows:—

Percentage of economical output	50	75	90	100	120
Steam consumption, in lb. per kw.-hour ...	12·9	12·2	11 95	11·8	12·3

The makers are Messrs. C. A. Parsons and Co., Ltd.. of Newcastle; Messrs. Merz and McLellan have acted as consulting engineers, and have conducted the tests.